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The link between career risk aversion and unemployment duration: Evidence of non-linear and time-depending pattern

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The link between career risk aversion and unemployment duration: Evidence of non-linear and time-depending pattern

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Abstract[1]:

In this study, we investigate the nexus between career risk aversion and unemployment duration based on German survey data (GSOEP). Using a direct measurement of career risk aversion, we do not find a statistically significant linear effect from risk aversion on unemployment duration. However, we find significant effects when controlling for a non-linear or time varying correlation between risk aversion and unemployment duration. Our results show that risk aversion is important when deciding when to leave unemployment. This research takes into account the high complexity involved in how risk aversion enters an individual's decision process during a job search.

Keywords: unemployment, risk aversion, duration model

JEL-Classification: J64, J24, D81, C41

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[1] Comments from Dietmar Fehr are gratefully acknowledged. This study uses the GSOEP – see http://www.diw.de/en/soep for details. Stata 10.1 was used in all calculations. All remaining errors are our own.

1 Introduction

In economics, it is well known that risk aversion might have an influence on economic decisions, as has been found, for instance, in the field of occupational choice, human capital and investment behavior (e.g. Levhari and Weiss 1974, Bonin et al. 2007, Belzil and Leonardi 2007, Pfeifer 2008a and 2008b). Despite this line of research, little is still known about the way risk aversion affects labor supply. One such situation is the job search, where the individual has to decide when to stop searching and accept a job offer. Information about the dispersion of risk aversion and the nexus to unemployment duration is substantially necessary for an efficient organization of unemployment insurance systems (Acemoglu and Shimer 1999).[2]

Job search theory implies that risk aversion leads to lower reservation wages and therefore quicker job acceptance. Subsequently, this should cause shorter job search periods and durations in unemployment (Pissarides 1974). However, the challenging part in studying the effect of risk aversion in affecting the duration of unemployment is that it can be different and complex in nature (e.g., Schoemaker 1993).

Previous research on the importance of risk aversion in job search has mainly focused on reservation wages, while the effect of risk aversion on unemployment duration has been addressed in only a few studies. Empirical research shows that risk aversion tends to lower the reservation wage (Pannenberg 2010) and may tend to cause shorter unemployment durations (Feinberg 1977) while Diaz-Serrano and O'Neill (2004) find that more risk averse people are more often unemployed. Pfeifer (2008a) shows that risk aversion affects labor market outcomes in general, focusing on several outcomes (e.g., job change, type of contract, on-the-job-training). Furthermore, experimental research supports these findings. Cox and Oaxaca (1989), for example, find risk averse people to stop searching earlier than risk neutral people, which is in line with the general expectations. However, Schunk and Winter (2007) find no evidence for the importance of risk aversion in affecting unemployment durations while their results provide support for the thesis of the relevance of loss aversion in the job search process.

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[2] The argumentation in Acemoglu and Shimer (1999) follows the idea of that risk aversion causes a level of productivity below efficiency due to sub-optimal investment strategies. The presence of unemployment insurance may help solving this problem by making risk averse people open for risky jobs (having a higher productivity) and therefore allowing optimal investment in capital in the economy. Furthermore, risk aversion has been underreported in evaluation studies, which may evoke concerns when it shows up to be substantive in the search process. Finally, information about the importance of risk aversion may also help in terms of improving subsequent counseling in the active labor market policy and related job placement activities.

Our study contributes to this strand of research and provides more detailed evidence on the relevance of risk aversion on unemployment duration. In particular, we extend previous research by using a context specific measure of risk aversion instead of using a generalized question on risk aversion or related approximations. And, we investigate the existence of a linear and time constant effect of risk aversion on the search process. In this direction our study also contributes to the discussion of whether the effect of risk aversion on job search refers to a strictly monotonic risk aversion in job search or not.

The empirical part of our study is conducted based on the German Socioeconomic Panel (GSOEP), which extensively asks for risk attitudes in the survey of 2004. In order to account for an underlying time-dependent nature of unemployment hazards, as well as right censoring, we use duration models that measure the influence of risk aversion on the time spent in unemployment. In studying the time-variant nature of the correlation between risk aversion and search duration we apply the cumulative Aalen hazard estimator as suggested by Hosmer and Royston (2002). We also consider many control variables in our modeling framework that have been suggested to be correlated with unemployment and risk aversion. Finally, we restrict the data in our analysis in order to account for potential endogenous correlations between unemployment propensity and risk aversion.

The remainder of the paper is organized as follows: Chapter Two considers theoretical reflections on the relationship between risk aversion and unemployment duration and reports previous empirical findings. Chapter Three provides information on the data set and measurement of the relevant attributes. Results of the empirical investigation are presented in Chapter Four. Finally, Chapter Five summarizes and discusses our findings and gives a brief outlook on the implications of further research.

2 Relationship between risk aversion and unemployment duration

2.1 Theoretical considerations

Search theory considers unemployment duration as a searching process where job offers are received at a constant rate and where individuals sequentially search for a new job (see Mortensen 1970 and McCall 1970 for details of the basic framework). A person looking for a job is confronted with a specific and known distribution of potential incomes. Variance of the income offers result from asymmetric information and different matching qualities. Usually, in search theory, the income distribution is taken as given and might be thought of as an a priori distribution that is revised while searching proceeds. The distribution properties allow for deriving expectancies concerning the possible income available to the job searcher, which shows up as an expected value for the individual. The costs of search are referring e.g. to the foregone income during the searching process.

The individual's choice whether to accept a job offer depends on the reservation wage *w**, which the individual sets after considering search costs and the expected benefits of continuing search activities. The individual decides to accept a job offer (*w*) if this is at least as high as the reservation wage:

$$w \geq w^{*} . \tag{1}$$

Several extensions of this simple model have been suggested that also include variance in search intensities (Burdett 1978), insecure information about the wage offer distribution (Burdett and Wishwanath 1984), endogenous job offers and non-stationarity in job search (van den Berg 1990). However, little attention has been spent on the role of risk aversion in the utility function affecting the search process.

Risk aversion is thought of as a concept where a person chooses safe options, rather than alternatives with probably higher but riskier rewards. In the context of job search this means that individuals will not only include the search costs and the benefit of further search in their choice to continue search activities but also account for the expected dispersion of job offers (riskiness). For example, in the case of risk aversion, one may think of individuals who (when highly risk averse) systematically depreciate later job offers and thus associate these jobs with a lower utility (for related empirical evidence see, for instance, Hartog and Vijverberg 2007). Alternatively, we may also think of a discount for job offers associated with a higher uncertainty (e.g., Rothschild and Stiglitz 1970).

The general idea behind these illustrations emphasizes that the expected value and the related expected utility deviates for non-risk-neutral individuals (von Neumann and Morgenstern 1944). In this concept - as referred to as the expected utility theory – individuals are assumed to react sensitive on the riskiness of a reward while the importance of the riskiness for the choice between different options is defined in terms of a risk premium that compensates - in relation to the risk neutral situation - the lower (higher) utility in case of a (secure) riskier option.

Pissarides (1974) explicitly accounts for this conception of risk aversion in the job search, where he integrates the risk premium argument in the framework of job search activities. [3] In this case expression (1) changes to:

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[3] It is important to remind the reader of numerous criticisms in economics and psychology concerning the practical relevance of expected utility theory, resulting in numerous proposals comprised in non-expected utility theory. For an overview see Starmer 2000. Even though we follow the idea suggested by Pissarides (1974) as it is (to

$$EU(w) \geq E(w) - p = w^*_{risk} \quad (2)$$

and where

$$w^*_{risk} = w^*_{norisk} - p \,. \quad (3)$$

As can be seen in Equation (2), the difference between expected utility *EU(w)* and expected value *E(w)* caused by risk aversion gets smaller as the absolute value of the risk premium *p* decreases. In the case of risk neutrality, the risk premium is zero and the left hand term in Equation (3) equals the risk neutral reservation wage on the right hand side; with *p* being positive, risk aversion must be compensated. In this case the reservation wage set by the individual decreases by the amount of *p* (see Equation (3)) and he or she is prepared to accept a job more quickly. Following this idea we should expect that the unemployment duration will be shortened in case of increased risk aversion. However, the specific form of how *p* affects the reservation wage and in consequence the search process is left unspecified.

With focus on the effect of risk aversion on the duration spent in job search we are concerned with the following interrelation:

$$\Delta riskiness = \Delta p \Rightarrow \Delta w^* \Rightarrow \Delta search \quad (4)$$

For instance in a linear interrelation we would assume that a certain difference of risk aversion (Δ*riskiness*) between individuals always causes a homogenous change on search duration (Δ*search*) – independent of the level of risk aversion and of the time already spent for searching. Given that (Δ*search*) adequately corresponds to the individual's change of wealth due to job search our assumption implies a utility function with constant risk aversion. Traditionally, economic theory usually assumes monotonic risk aversion in wealth. However, in this study we especially doubt the existence of such a related monotonic and time invariant interrelation between risk aversion and the stopping rule in the search process.

2.2 Empirical studies and research outline

Empirical evidence on job search theory is fairly broad and extensive (see for an overview Eckstein and van den Berg 2007) and recent contributions to this field of research also include experimental designs that also address issues suggested by behavioral economics

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our best knowledge) the only framework which allows considering decisions under uncertainty or riskiness in the job search process.

(e.g., Cox and Oaxaca 2008, Schunk and Winter 2007). However, empirical research that contributes to the issues of risk aversion in the context of job search are rare. In fact, there is only one study testing the influence of risk aversion on the duration of unemployment directly (Feinberg 1977), while other studies test the influence of risk aversion on the arrival of unemployment (Diaz-Serrano and O'Neill 2004) or on changes of the reservation wage (Pannenberg 2010). Even though, all of these studies base their theoretical argumentation on search theory.

Using a duration model in the reduced form approach, Feinberg (1977) finds unemployment duration to be shortened with higher risk aversion. Unfortunately, the data set used by Feinberg does not contain a direct risk measure but instead builds on an index considering behavior in different risky situations, such as having insurance on cars.

Cox and Oaxaca (2008) find in their empirical experiments that risk averse people stop searching earlier, than risk neutral people, as proposed by job search theory. Schunk and Winter (2007) are interested in the reason for the earlier stopping of job search than proposed by standard job search theory by many people. They proposed two different explanations. One of them is the existence of risk aversion, while the other focuses on the existence of limited cognitive processing capacities. However, in their investigation they do not find evidence for risk aversion, but for loss aversion (Kahnemann and Tversky 1979).

Diaz-Serrano and O'Neill (2004) test the interrelation of risk aversion and the occurrence of unemployment using a logit model. The data set used by the authors contains a question about risk aversion modeled as a lottery game. The authors use the answers to build an Arrow Pratt absolute risk measure. Surprisingly, they find that more risk-averse people tend to be unemployed more often. However, the state of unemployment does not say anything about the duration of unemployment. Nevertheless, the results indicate that people who are more risk averse tend to self-select into safer jobs.

Pannenberg (2010) tests the influence of risk aversion on the value of reservation wages. He uses a fixed effects panel model to control for unobserved heterogeneity. Using GSOEP data, he is restricted to the general risk question, the only one asked at two points in time. Pannenberg finds a negative correlation between risk aversion and reservation wages, as predicted by search theory.

Pfeifer (2008a and 2008b) focuses more broadly on risk aversion and studies the correlation between risk aversion and several labor market outcomes. For instance, he finds that risk aversion is correlated with the type of contract, job changes, on-the-job-training and the type of occupation. Furthermore, he points to the importance of using context specific risk measurements instead of a general indicator.

Concluding these findings, most studies confirm the implications set by search theory: risk aversion leads to a lower reservation wage and, followed by this, shorter unemployment durations. Following the concept suggested by Pissarides (1974) the major nexus between risk aversion and job search periods will thus operate due to the individual's utility function while previous findings provide support for a constant or at least a monotonic risk aversion in job search. However, recent critique has raised concerns with this idea (e.g., prospect theory; Kahnemann and Tversky 1979). In the basic setting prospect theory assumes that the utility is a composition of two distinct steps in the individual's decision process that adds a value-link and a weighting function to the specific outcome.

In accordance with the findings of Schunk and Winter (2007) risk aversion as it is usually understood or measured may be more likely to operate as or due to channels of loss aversion. If so, individuals differ in their valuation of losing and holding options (given identical option values). In our case this provides support for the idea of a more complex nexus between utility and risk aversion in job search because giving up a specific job option in order to continue search for better options is a typically issue in job search.

3 Data and Measurements

Our analysis is based on the German Socioeconomic Panel (GSOEP), a representative sample of the German population, yearly inquired since 1984 (Wagner et al. 2008).[4] The questions about risk aversion are not regularly asked in the panel and are presented only in 2004 and 2006 while in 2004 this is also combined with a very detailed battery of items. In addition to a lottery question, there are additional questions asking for a direct estimate of the person's risk aversion, so that the data includes a generalized risk measurement and a set of context-specific measures.[5] Because we are especially interested in risk aversion in occupational surroundings, we focus on the career specific attribute. For the generalized measurement of the individual's risk aversion, the GSOEP asks whether people think of themselves as being more or less risk averse in general. The answer can be given based on eleven response categories with the lowest value marking the highest risk aversion. The same scale is used to identify context specific risk aversion. Furthermore, as suggested in other empirical research on job search we define job search duration in terms of the time spent in unemployment.

[4] For detailed information see http://www.diw.de/en/soep .

[5] The general question in the GSOEP 2004: „People can behave differently in different situations- How would your rate your willingness to take risks in your occupation career?" (0: risk-averse, 10: fully prepared to take risks).

3.1 Measurement of risk aversion

In the first step we are concerned with finding an adequate identification for risk aversion as it is referred to as *p* in the theoretical discussion. When deciding for a risk measurement, one should keep in mind the controversial interdisciplinary discussion on the possibility of measuring risk aversion. First, there is the question of the meaning of risk aversion. Is there a personal disposition for risk or is risk aversion a context specific construct? Actual results show that it seems to be a person specific disposition that is independent of different contexts even though the different contexts seem to give an additional explanation for the individual's behavior (Dohmen et al. 2009, Krahnen et al. 1997) when examining questions in these contexts.

Figure 1: Dispersion of risk aversion

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We take the actual results into consideration and make use of the context specific risk measure (see also Pfeifer 2008b). Comparing this one with the general risk question shows considerable differences in our data set (see Figure 1). Most people (n=259) think of themselves as being more risk averse in general than in career specific matters (general minus specific). The histogram below shows the difference of generalized risk aversion and career specific risk aversion.

A further point is controversially discussed, especially between psychologists and economists. In a traditional fashion, economists usually believe in constant preferences as they also believe in a non-changing risk aversion over time. Psychologists, in contrast, believe that risk aversion is, in general, able to alter with time or within different contexts and situations. Sahm (2007) for example finds that risk tolerance is sensitive to external changes like aging and changes in macroeconomic conditions while the disposition to take risk is relatively constant and tends to persist in terms of systematic individual differences. However, Pannenberg (2010) reports variance of risk aversion over time for the general measurement of risk aversion at the individual level within a two-year period.

The third point is a methodological question of how to measure risk aversion. The question here is whether people are able to estimate their risk aversion in practical situations when asked an abstract question. For instance, people might have difficulties in imagining their reactions in real situations and sorting their degree of risk aversion. In such cases, measuring the individual's stated risk aversion might depend on the degree of risk aversion itself. We will account for this and conduct extra investigations that use different standardizations, which we include in our robustness checks. Nevertheless, the questions on risk aversion asked in the GSOEP have been tested in their relevance for real actions (Dohmen et al. 2009), which reveals robustness, reliability and validity in the used instruments in an experimental setting. Thought related answers can be treated as adequate measures of the individual's risk aversion.

3.2 Measurement of unemployment duration

In our sample, we concentrated on individuals employed in 2004 - meaning that all persons had a 12-month employment period in that year. Furthermore, we also included only persons who answered the question on risk aversion and who experienced unemployment afterward. Both restrictions are very important because they account for the potential problem of endogenous correlation and allow us to focus on individuals who are likely to receive job offers, as is presumed by job search theory (job offer rate is unequal to zero). Finally, we restrict our sample to people between 22 and 62 years of age to focus on the labor force population.

Measuring risk aversion in the 2004 data, our unemployment spells start in 2005. In the data, we are able to observe these unemployment spells up to the end of 2007 - allowing for an observation period of 36 months. Our measurement of unemployment duration depends on a retrospective question that asks for the employment status of each month in the previous year. This monthly information is transferred to an un-interrupted unemployment episode. Doing so, we have 543 unemployment observations (472 observations with multivariate non-missing information) in our data that represent 4227 spells that include 360 quits of unemployment periods.[6]

3.3 Control variables

In measuring the influence of risk aversion on unemployment duration, we considered a broad set of control variables:

Personal characteristics:

First, there are personal characteristics influencing unemployment duration and, as different studies show, also risk aversion.

[6] Most individuals are observed only once with a period of unemployment. However, we also find some of the people to be unemployed twice or more often. In our analysis, we allowed these individuals to be at risk as often as they re-entered unemployment.

- For example, several studies show an increasing risk aversion with age, which seems to be especially the case from 40 years onward (Dohmen et al. 2005, Harrison et al. 2007). Studies examining the influence of sex on risk aversion report strong gender differences (Eckel and Grossman 2008, Barsky et al. 1997, Dohmen et al. 2005). This is also supported by research on self-employment (e.g. Wagner 2007). Likewise, gender differences and age specific patterns are found in job search behavior and the acceptance of job offers (e.g. Bellmann and Brussig 2006)
- In addition to age and sex, we include in our model the presence of children. The motivation is that the individual's disposition to have children might reflect his risk aversion, while having children also directly influences the individual's search effort and acceptance probability (e.g. due to restrictions in terms of regional job mobility or the necessity of a regular income). With a similar background, we also control for the existence of a (married) partner because a partner might provide financial security and allows for longer job searches.

Human Capital attributes:

To control for the individuals human capital, we use schooling and qualification attributes. Following previous findings we focus on the most important factor for success in job search in Germany which is the presence of examined apprenticeship training. Furthermore, we also include an income specific characteristic and information on employment history. The idea here is that human capital attributes have been proven to have a substantial impact on an individual's job search, the related job offer rate and the setting of the individual's reservation wage. In addition, there are also studies that indicate that risk aversion and the production of human capital are not independent (e.g. Guiso and Paiella 2005; Levhari and Weiss 1974).

Contextual characteristics:

Beside individual characteristics, we are convinced that it is important to control for contextual conditions. For instance, individuals may choose specific occupations, industries or firm sizes as an aspect of expected job security, while contextual characteristics may also correlate with variance in the job offer rate. Therefore, we include the mean of the related attributes:

- Strong evidence exists for an interrelation between risk aversion and occupational choice. For instance, Guiso and Paiella (2005), Buurman et al. (2009), Pfeifer (2008b) and Bonin et al. (2007) find more risk-averse people to sort more often into the public sector. We, therefore control for sector and job (type of occupation) specific information. In particular, we include the security given by different jobs by the mean of their number of yearly unemployed. Safer jobs (like those of the public sector) have a lower occupational dynamic and the employees should be found less often in unemployment. Aside from different occupations, we also consider different industries.

- Another criterion for the security of a job is the size of the firm (number of employees) the person is employed in. As empirical findings suggest, instability and the likelihood of permanent job separations are higher in smaller firms (Kölling, 2009, Mayo and Murray 1991). Assuming that risk averse people are mainly concerned with job loss and that the firm's elasticity in employment dynamics on economic changes interplays with the size of the firm, we use the size of the firm as a proxy for the insurance strategy against job loss.

Other characteristics:

- To measure the readiness to adapt to the circumstances of a potential job search, we also controlled for the readiness to accept a wage loss to re-enter wage work. This measure is based on a question that refers to a hypothetical situation of unemployment and the hypothetical wage desired to accept a job offer. We link this reservation wage to current income to construct our measure.
- We further think that the degree to which a household worries about further economic development proxies further determines the individual's search activities and correlates with risk aversion. We use this measure as an additional catch all attribute for a further reduction in unobserved heterogeneity.

4 Empirical analysis

4.1 Descriptive analyses

As displayed in Figure 2(c), the hazard function appears as expected. The likelihood of becoming unemployed first increases up to the 6^{th} month of observation and then declines. After a period of 22-24 months, a second peak appears that indicates the final end of unemployment benefits. This is a picture also found in other studies. Collier (2005), for instance, reports an almost identical duration density distribution using UK data. A similar pattern in the hazard function is also reported in Biewen and Wilke 2005, Addison and Portugal (2003) and Fahrmeier et al. (2000), while Heining and Lingens (2006) observe a distribution that is more likely to follow a sickle-shaped pattern without a second peak, using data from the Integrated Employment Biographies (IEB).

Even though other studies find a similar pattern, we checked whether the second peak might be caused by data issues rather than by exits from the data pool. For example, this might be the case due to panel mortality. However, if panel mortality differs across risk aversion and the likelihood of employment, we would see this in different densities of the measured durations (see Figure 2 (a) and (b)). In both cases, the properties of the distributions are almost equal. This indicates that differences in censoring are not responsible for the second peak point.

Figure 2: hazard distribution across time

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Illustration (d) of Figure 2 finally shows the cumulative hazard functions differentiated by levels of risk aversion. The 11 categories of risk aversion are aggregated into five categories to make the picture clearer. The graph shows a similar pattern for all categories until the 15th month and remarkable differences afterward. However, there is no clear connection with risk aversion. People having the lowest risk aversion are found to have fewer exits. Because this difference is not relevant before the 15th month, risk aversion can be thought of as having a different influence depending on the time spent in unemployment. For instance, it might be the case that risk averse people lower their search intensity or - following the theoretical discussion earlier - that risk aversion captures issues related to loss aversion. In the latter case giving up secure options in order to continue job search is more costly for those who report high levels of risk aversion. Furthermore, we also find that people observed with the second highest level of risk aversion have the highest cumulative hazard function from the 20th month onward which points to the presence of non-linearity in the correlation between risk aversion and unemployment duration.

4.2 Econometric model and estimation results

In our econometric setting, we focus on modeling the duration of unemployment, or alternatively, becoming employed in a given time interval as a function of a set of covariates while we concentrate on covariance with risk aversion. Because the shape of the underlying hazard function is somewhat specific, we tried different parametric and semi-parametric modeling approaches to fit the observed shape of the hazard function. We did so because the results of the duration and hazard rate models are known to be sensitive to the general modeling framework (e.g. see van den Berg 2001). We started by trying different hazard rate models, followed by different accelerated failure time (AFT) models, which are better able to fit the curve of the function described above. The two types of modeling approaches differ especially in the way they model duration dependence. While hazard models formulate the event of interest in a time depending risk of occurrence framework, AFT models focus on modeling the duration itself.

In more detail, hazard rate models measure the probability of leaving a state at *t* having remained in the state up to *t*. Therefore, hazard rates can be understood as local transition rates at the end of a certain time interval (Δt) given that these individuals are at risk at the beginning of that time interval. This is equivalent to the following expression:

$$\frac{f(t|x)}{S(t|x)} = h(t|x_j) = h_0(t) + exp(\beta_0 + x_j\beta_x)\text{; with } h(t) = \frac{Pr(t \geq T \leq t \quad 1)}{\Delta t}$$

where $F(t)$ ($F'(t) = f(t)$) is the cumulative density distribution of the unemployment duration, with *t* as an indicator of duration, and $S(t) = 1 - F(t)$ as the corresponding survival function. h_0, as the baseline hazard function, may be modeled by any functional form. *x* represents a set of covariates that we allow to be correlated with the hazard rate and the β are the associated estimates for the magnitude of this correlation. In the corresponding failure time metric, the hazard of leaving a particular state is described in terms of the log duration until the hazard occurs. The function above can be transformed into the corresponding failure time metric:

$$ln(\tau) = \beta_0 + x'\beta_x + \varepsilon$$

in which the log duration $ln(\tau)$ is described as the linear function of a set of covariates *x*. The error term, ε, captures the distribution properties of the underlying 'baseline' hazard function. In contrast to hazard functions, the log-time metric focuses on scaling the expected duration while the hazard function describes the effect of the covariates in terms of shifting the hazard rate.

For the basic modeling framework we tested the sensitivity of different parameterizations using discrete and continuous time models. Furthermore, we also tested flexible approaches to handle state dependency by using spline smoothed hazard functions (Royston 2001) and we allowed for different types of frailty (gamma distributed and mass-point; see Jenkins 1997). However, our evaluation of the statistical modeling shows that despite the different model specifications, our results remain rather stable and unobserved heterogeneity shows up to be statistically insignificant. Our interpretation of this finding is that averaging out specific distribution properties does not harm the estimates we are interested in.

For descriptive purposes the results of our basic modeling approaches are displayed in Table 1 (model A). Note that all reported estimations base on the AFT metric and use a gamma-distributed parameterization of the baseline function. As can be seen, the coefficient of risk aversion shows the expected direction, which indicates that hazards from unemployment increase with risk aversion (alternatively: expected durations are accelerated). However, as reported in the table the estimate of the coefficient does not reveal a significant effect from career risk aversion on unemployment duration.

Since we tested different specifications of our basic modeling approach, we may treat our finding to be final, meaning that risk aversion and unemployment duration seem to be uncorrelated. However, in the related modeling framework, we implicitly make the assumptions that a) risk aversion is affecting the duration of unemployment in a linear and monotone way and b) that it does not change its effect over time. Both assumptions implicitly refer to the concept of a linear relation between risk aversion and unemployment duration. To check the accuracy of these assumptions we conduct different supplemental analyses.

Major findings

a) Non-linearity hypothesis

Our first analysis in testing the presence of a non-constant effect of risk premium focuses on the idea that risk aversion may influence unemployment in a non-linear way. In fact, there is no natural reason to think of a linear correlation between risk aversion and unemployment duration. In particular, in our opinion accounting for a non-linear interrelation between risk aversion and search duration may refer to the presence of a non-linear margin of changes in *p*. To deal with this issue, we test three different models - see Table 1.

Table 1: Models considering risk aversion in a non-linear way

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We first conduct a model based on a set of dummy variables with risk aversion being measured in five categories (see model B).[7] This is the most flexible approach in handling state dependency and can be used to identify potential functional forms of the underlying correlations. As it can be seen in Table 1 the estimation results indicate a positive effect for the higher categories compared to risk category two. However, the estimates referring to a categorized measurement strongly depend on the definition of the reference category - in our case, category two, which includes risk values 2 and 3 (see for the definition footnote 5). Focusing on the magnitudes of the displayed coefficients shows that the effect of risk

[7] Category 1 = risk values 0 to 2; category 2 = risk values 3 and 4; category 4 = risk values 5 to 8; category 5 = risk aversion values 9 and 10.

aversion tends to increase with the distance to the reference group. This provides support for the non-linear relationship between risk aversion and the acceleration of unemployment duration.

Finally, models C and D in row three and four directly address a specific pattern of the underlying non-linear correlation, testing cubic and squared forms of the correlation. With respect to the results in Table 1, our findings mainly provide support for the superiority of the specification that includes a squared term of risk aversion in affecting the hazard from unemployment. This is evidence for a one-point inflexion pattern in the level of risk aversion in determining unemployment duration (u-shaped; inversely u-shaped if we focus on the hazard metric) – which is supported by a Sasabuchi test (P>|t| = 0.024) with an inflexion of the corresponding correlation at a risk value around 4.6.

b) Time-dependence hypothesis

In the second part of the empirical analysis we concentrate on a time-dependency pattern in the correlation between risk aversion and the duration of unemployment. Two theoretical reasons motivate this procedure. First, we may think that the risk premium interacts with the level of information. In this case we would expect that risk aversion simply starts to interplay with the individual's utility function when the mean job search time starts to run off and initial information has been collected. Second, we focus on a potential nexus between the measure of risk aversion and loss aversion (see Kahnemann and Tversky 1979; Schunk and Winter 2007). Here, we may expect that acceptable jobs are found only after an initial period of searching (e.g., due to learning) and that continuing searching for better jobs will cause a relative decrease in the individual's utility which follows a jumping slope across time.

Figure 3: The time dependence of career risk aversion affecting the duration in unemployment

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To make time variation visible, we use a graphical assessment of the time variation of the coefficient using the Aalen additive hazard model (Aalen 1989; Hosmer and Royston 2002). With this method, it is possible to estimate time varying effects by allowing the coefficients to be additively associated with the baseline function.[8] Given the cumulative Aalen estimator,

[8] PH models in contrast associate the coefficient's multiplicatively to the baseline, in which time dependence is modeled. It follows that the coefficients behave proportionally to the baseline and are forced to be constant in time. For a more detailed discussion, see Hosmer and Royston (2002).

time variation of the coefficient is displayed by plotting the time varying coefficient against time, where the magnitude of the effect in a certain interval refers to the slope of the graph and where effects are reported in terms of the hazard metric.

As the first picture in Figure 3 shows, there is no support for a constant effect of career risk aversion on the hazard of unemployment with time in general. A constant effect can be found only piecewise for the first eight months and for the period between 18 and 21 months while risk aversion seems to be uncorrelated with unemployment hazards in the periods between the 8^{th} and 18^{th} month and beyond the 21^{st} month.

To test the statistical relevance of these graphical signs, we use a model specification (see Table 2), where we focus on the interplay between risk aversion and a set of indicator variables that correspond to the relevant time windows found in the graphical analysis. We built three indicator variables that collapse the time periods, as signaled by the constant periods in the cumulative Aalen estimator. The results of this approach can be found in the second row of Table 2 (model E). As one can see, no economically or statistically relevant effect can be found in this specification.

Table 2: Models considering time-dependence of the risk aversion coefficient

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In set of additional modeling approaches, we used a multipolynomial specification of time dependence, in which career risk aversion interacts with a linear, squared and cubic term of time (measured in months) which can be found in Table 2 (model F). In model G and H, this approach is extended by a fourth order polynomial specification of time. What we find in our approaches is a clear evidence for our hypothesis of time dependence of risk aversion in affecting unemployment durations. In more detail, the findings in model F imply that the effect of risk aversion first tends to increase, then decreases and finally increases again. Using the related parameter estimates, we will find the maximum point of inflexion at t = 10, while the minimum is around 29 months. As further robustness checks show (see model H), insignificance of the fourth order polynomial depends on missing support in the combination of time and risk aversion in the upper range (high-risk aversion in the upper tail of the process time). Excluding related observations (risk aversion above 9 and above 33 months of observation) leads to better fit of the statistical modeling and shows that a fourth-order polynomial correlation seems to be strongly plausible.

Evaluation of non-linear and time depending effects: simulations

Nevertheless, two points remain unsatisfying so far. Up to now, support has been given to both of our hypotheses, the non-linear (squared) effect and the time dependency of career risk aversion in affecting the likelihood to end up with unemployment. The second point is that polynomial specifications are rather complex and do not reveal a clear picture of the net effect. Accordingly, the contributions to the change of the hazard rate or the time scaling effects are far from being understandable without including the baseline function and transforming these results into a more tangible picture.

We therefore simulated survival estimates in order to asses both effects that are supported by our empirical analysis. However, instead of using a gamma model specification for the simulation we refer to the lognormal distribution (since H_0: kappa = 0 can be not be rejected on the common level of statistical significance). The results of this investigation are displayed in Figure 4. This graphical illustration displays the simulated survival function (y-axis) across time (x-axis) and in reference to career risk aversion (z-axis).[9] The upper graph (see (a)) shows the simulated values based on the non-linear (squared) specification of the risk measure, while the two lower graphs (see (b) and (c)) correspond to the time varying specification ((b): covering a fourth and (c) including a third order polynomial term).

Figure 4: Survival estimates based on non-linear and time-dependant effects

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Following the discussion above, three explanations of the nature of risk aversion in affecting unemployment duration can be taken into account. First, the survival function of the upper graph ((a)) reveals only a smooth squared effect in survival. The estimates would therefore support a lower hazard from unemployment for the very high and the very low risk averse people, while middle risk aversion leads to a much quicker departure from unemployment. Focusing on the middle picture (see (b)), our estimates support the assertion that the probability of remaining unemployed across time (here: survival in unemployment) follows a smooth but strongly monotone pattern for low values of risk aversion. Furthermore, this pattern converges to a monotone step-like shape with the presence of two saddle points for the very high-risk averse population. In an extreme case of risk aversion, our prediction reveals that, in periods between 0 to 3 and 18 to 22, we would almost expect a constant rate

[9] For the simulation we refer to a reference (mean-median) person which is male, 41 years old, having no partner and no children, being formally trained (apprenticeship), with unemployment experience before, an monthly net income of 2150 Euro and having a previous working context averaged context specific unemployment durations (see Table A2).

of probability of remaining unemployed (share of survivors). In the lower graphical illustration (see (c)), which addresses a third order polynomial specification, this step-like pattern in the survival function would be less pronounced and is more like an inverted s-shaped function. Here we find a strong decrease in the survival function for the high risk scores between the 12th and the 20th month of unemployment which reflects a high tendency to stop searching. In general, the illustration (b) and (c) show that the higher the risk aversions the more sensitve people react on the elapsing time in quitting unemployment.

Nevertheless, all survival estimates emphasize that, with an increase in risk aversion, we must expect an increase in the share of individuals who remain unemployed. We take this as an indication of the rejection of the hypothesis that unemployment hazards increase with risk aversion and that highly risk-averse people tend to accept job offers more quickly. This picture contradicts to what is found in earlier studies. Furthermore, support is given for the hypothesis that a subsequent risk premium is unlikely to be linearly related to the period spent for searching – or alternatively that time variation may be present in the individual's utility function.

To assess the most likely nature of the correlation of risk aversion with unemployment duration, we refer to two simple indicators. First, focusing on the entropy of the statistical models, we have sufficient evidence that the fourth polynomial description of risk aversion in affecting unemployment duration is better than the squared or the third order polynomial description. However, testing the time dependence of the effect, the squared nature of risk aversion in affecting duration reveals that the effect is linear across time. A graphical assessment of this investigation is displayed in Figure 3 (graph two on the right hand side), which shows that an effect that includes a linear and a non-linear squared effect diminishes the potential time varying effect of risk aversion. Unfortunately, a specific test that allows us to indicate the most valid nature of risk aversion in affecting unemployment duration does not exist.

Robustness checks

Finally, it is worth noting some robustness checks we conducted to test whether our findings depend on certain specifications in our analysis. As a first step, we examined the stability of the results using different measurements for risk aversion. The background of this procedure refers to the context that risk aversion has no natural meaning, or no point of reference, and that measures may be affected by the individual's perspective of the measuring risk aversion.

In addition, because the GSOEP is a panel survey, it may suffer from issues with panel attrition. We therefore reran all analyses, including a weighting scheme that controls for panel mortality and that also includes the censoring of historical information. Furthermore, we also conducted all analyses based on a sample that is less restrictive in its population. In the robustness checks, we allowed our population to have at least 10 months of employment, not 12 months as used above, to avoid endogenous correlations related to the effect of risk aversion.

Further objections may relate to the definition of unemployment. For example, unemployed individuals with very short episodes may be more likely to already be focusing on specific job offers, or may already have signed a new contract. This is a strong concern because such issues may bias our estimation due to unobserved heterogeneity that may also potentially correlate with risk aversion. We therefore removed all individuals with only one month of unemployment and re-defined the second month as month one. To some extent, this should also account for concerns that are indicated by Jürgens (2004), who reports that up to one quarter of the reported periods in the GSOEP may be subject to measurement errors.

To sum up, none of our checks reveals substantial differences from the results that we discussed above. Detailed information on each single check is available from the authors.

5 Summary and Discussion

Addressing the deficit in research on the influence of risk aversion on unemployment duration, we used German micro data that allowed us to measure individuals' risk aversion based on a direct, context specific measurement. Following search theory, reservation wages should be lower for risk-averse individuals, and therefore influence the expected duration of search, which we identify as the time spent in unemployment. To confirm this finding, we proofed different types of modeling approaches that controlled for unobserved heterogeneity and conducted different robustness checks.

Our results show that when considering time dependent patterns in the hazard alone, we did not find support for the thesis that risk aversion causes shorter (or longer) unemployment durations. However, we found significant effects when considering the non-linearity and time variation of the effect of risk aversion on unemployment duration. This is a clear support to reject the presence of a linear interrelation between risk aversion, risk premium and the job search process. In more detail, we found that risk aversion is either inversely u-shaped in its correlation with unemployment duration (u-shaped with leaving unemployment) or that risk aversion differs in its effect on unemployment duration, depending on the elapsed time.

We interpret this finding as a support for a non-monotonic or time variant relation of risk aversion in the individual's utility in the context of job search. In our view this supports a more complex interrelation between risk aversion and utility than traditionally emphasized. Therefore, the core finding of this study is in our opinion that our results contribute to a better understanding of the role of risk aversion in the search process and that it offers questions for further research in the subject of job search. In particular, time variation and non-linearity in this context had not been observed so far. Furthermore, the simulation of the time depending risk of remaining unemployed reveals that risk aversion in its more complex modeling approach does refer to a reduction of the expected unemployment duration as it is previously found in empirical studies (Feinberg 1977). Instead we find that the risk of remaining unemployed slightly tends to increase with risk aversion – particularly in extreme cases of risk aversion.

However, a shortcoming of our research concerns a missing differentiation of time variant and non-linear nexus between risk aversion and unemployment hazards. Evidence, of which effect refers to the nature of the correlation between risk aversion and unemployment duration, if it is even possible to be disentangled, remains unclear. Therefore, further research is needed to understand the process of how risk aversion works completely.

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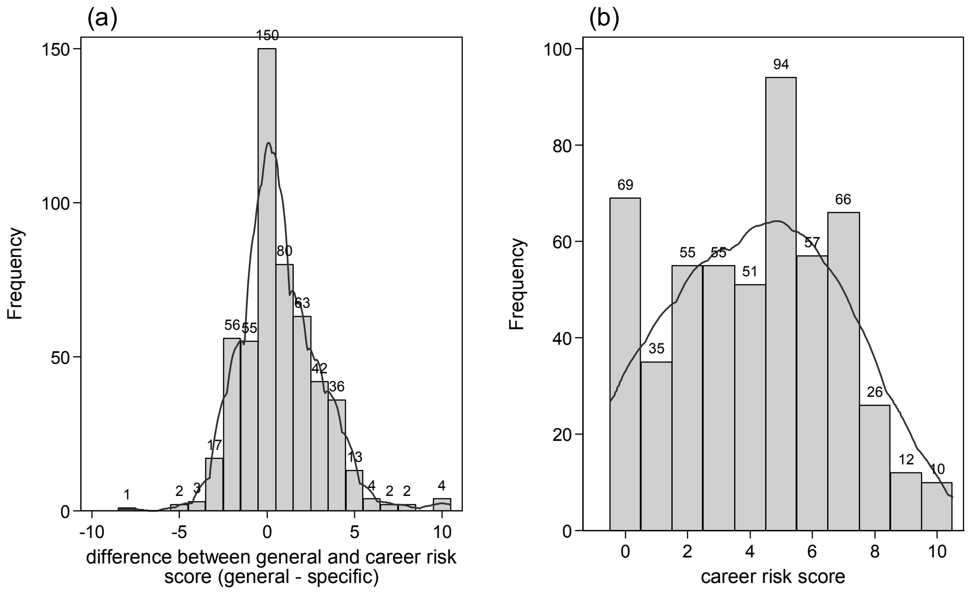
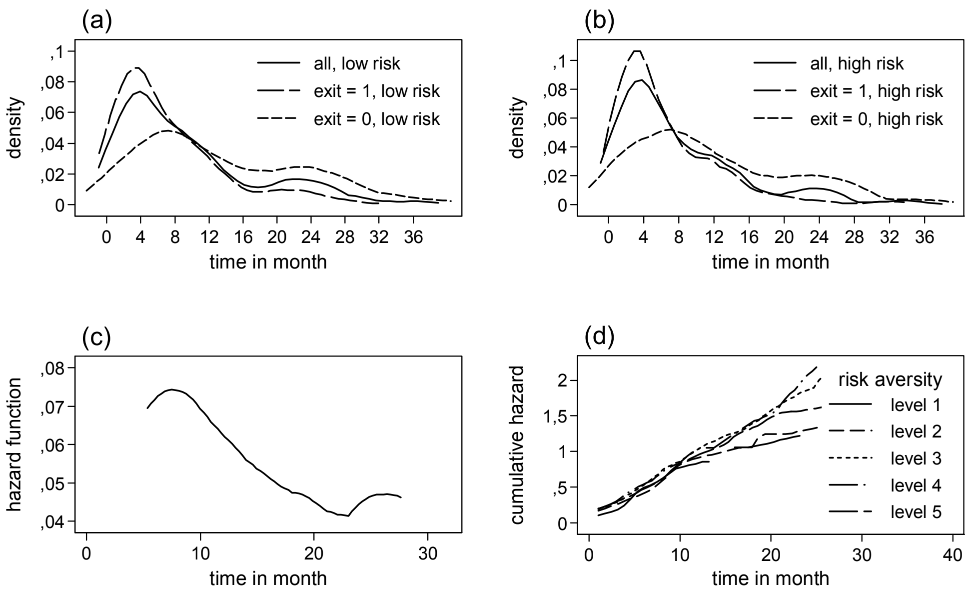
Tables and Figures

Figure 1: Dispersion of risk aversion



Source: GSOEP, own calculations

Figure 2: Hazard distribution across time



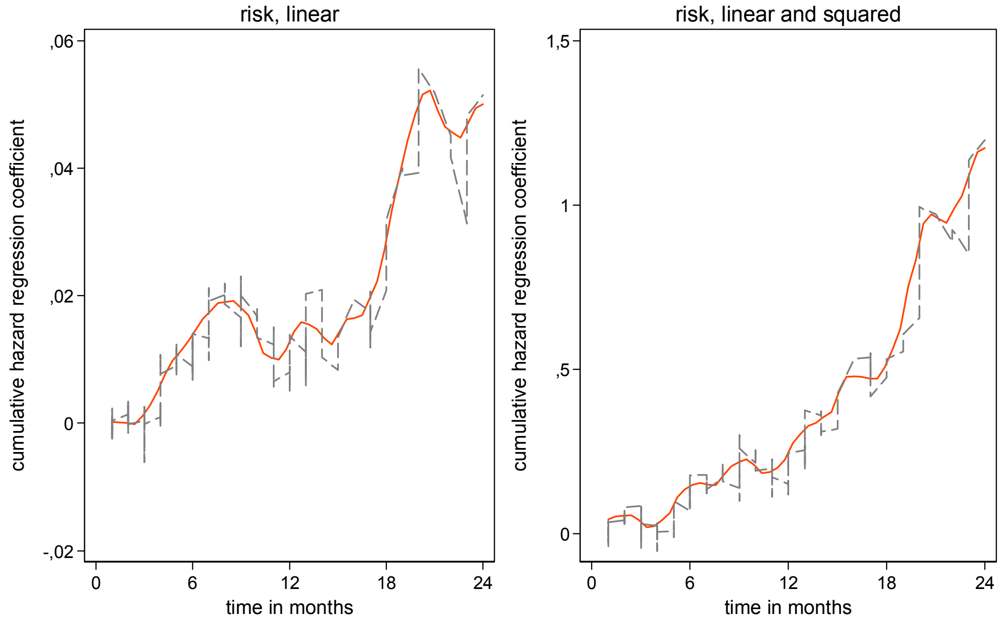
Source: GSOEP, own calculations

Table 1: Models considering risk aversion in a non-linear way

Variables	model A	model B	model C	model D
male	0,072	0,049	0,022	0,03
age	0,064***	0,064***	0,064***	0,064***
household	-0,389***	-0,397***	-0,403***	-0,403***
partner	-0,389*	-0,390*	-0,414**	-0,407*
children	-0,197*	-0,198*	-0,191*	-0,196*
training	-0,345**	-0,324**	-0,310*	-0,309*
unemployed before	0,157	0,164	0,157	0,16
employment history	-0,349	-0,378	-0,357	-0,377
wage before	-0,000**	-0,000*	-0,000*	-0,000*
mean ue in occupation	0,162*	0,160*	0,153*	0,156*
mean ue in industry	0,003	0,011	0,013	0,012
mean ue in the group of firm size	0,003	0,011	0,013	0,012
accept lower wages	-0,553***	-0,548***	-0,557***	-0,554***
worries about the future	-0,119	-0,121	-0,126	-0,125
career risk score	-0,023		-0,166**	-0,101
career risk score (dummies))[1]				
gr 1		0,142		
gr 2		reference		
gr 3		-0,099		
gr 4		-0,173		
gr 5		0,017		
career risk score sq.			0,017**	-0,001
career risk score cubic				0,001
constant	1,104	1,079	1,315*	1,299*
ln sigma	0,014	0,016	0,023	0,02
ln kappa	0,274	0,263	0,225	0,241
N	4227	4227	4227	4227
quits	306	306	306	306
ll	-558,808	-557,385	-556,225	-556,1
chi2	111,957	114,803	117,123	117,372
aic	1153,616	1156,769	1150,45	1152,201
bic	1267,902	1290,103	1271,085	1279,185

Notes:
GSOEP, own calculations; “ue” stands for the term unemployment
estimation results base on a gamma distributed duration model (AFT-metric)
)[1] category 1 (gr 1) = risk values 0 to 2; category 2 = risk values 3 and 4; category 4 = risk values 5 to 8; category 5 = risk aversion values 9 and 10

Figure 3: The time dependence of career risk aversion affecting duration in unemployment



Source: GSOEP, own calculations; estimates base on the additive Aalen estimator (Aalen 1989)

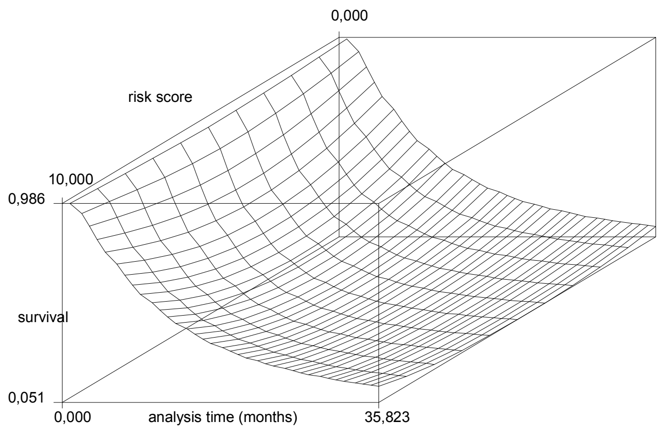
Table 2: Models considering time-dependence of the risk aversion coefficient

Variables	model E time windows	model F 3rd order polynomial	model G 4thorder polynomial	model H)[1] 4th order polynomial
male	0,088	0,058	0,049	0,058
age	0,060***	0,050***	0,048***	0,049***
household	-0,359***	-0,289***	-0,279***	-0,297***
partner	-0,346*	-0,239	-0,235	-0,201
children	-0,194*	-0,152*	-0,144*	-0,140*
training	-0,324**	-0,261**	-0,248**	-0,195*
unemployed before	0,139	0,1	0,094	0,098
employment history	-0,332	-0,244	-0,233	-0,335
wage before	-0,000**	-0,000*	-0,000*	0
mean ue in occupation	0,150*	0,130*	0,129*	0,121*
mean ue in industry	0,003	0,007	0,009	0
mean ue in the group of firm size	-0,147	-0,105	-0,101	-0,113
accept lower wages	-0,523***	-0,443***	-0,432***	-0,434***
worries about the future	-0,107	-0,097	-0,093	-0,094
career risk score		-0,152***	-0,184***	-0,222***
interaction between risk score and time (month)				
risk * t(0-7)	-0,036*			
risk * t(8-18; > 22)	0,008			
risk * t(19-22)	0,028			
risk * t(linear)		0,049***	0,076***	0,084***
risk * t(squared)		-0,003***	-0,008**	-0,009***
risk * t(cubic)		0,000**	0	0,000***
risk * t(4th order)			0	-0,000**
constant	1,252*	1,108*	1,063*	1,340**
ln sigma	-0,075	-0,186**	-0,189**	-0,268***
ln kappa	0,410*	0,138	0,048	0,315
N	4227	4227	4227	4119
quits	306	306	306	302
ll	-556,875	-547,851	-546,542	-531,348
chi2	115,823	133,871	136,488	142,98
aic	1153,749	1137,701	1137,084	1106,697
bic	1280,734	1271,036	1276,768	1245,811

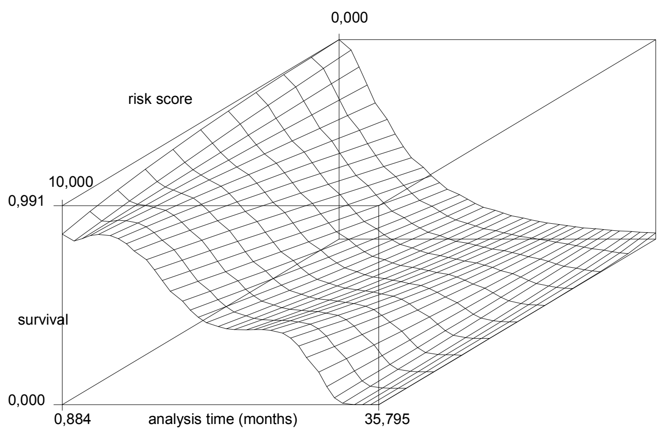
Notes:
GSOEP, own calculations; “ue” stands for the term unemployment
estimation results base on a gamma distributed duration model (AFT-metric)
)[1] In the model H we restrict the estimation on a subsample that does not include the upper tail of duration and risk aversion (observations with long unemployment durations and high risk scores) because of limited support in order to achieve more robust results.

Figure 4: Survival estimates based on non-linear and time-dependant effects

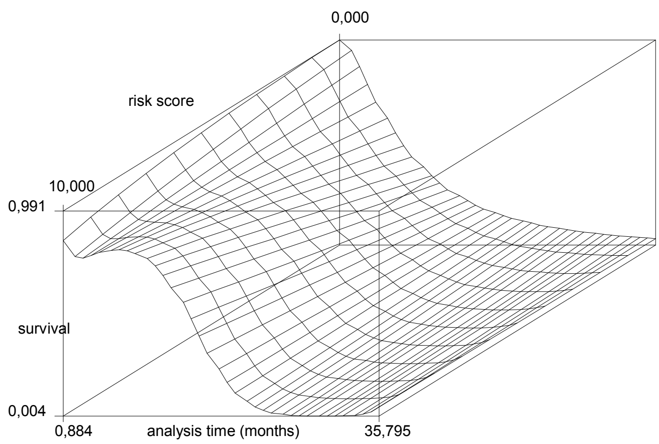
(a)



(b)



(c)



Notes: GSOEP, own calculations

Appendix

Table A1: Explanation of variables

Variable	Description
Personal characteristics	
Male	Dummy variable that takes the value of one if the individual is a male and zero otherwise.
Age	Metric variable measuring age.
Household	Dummy variable that takes the value of one if the individual is living in a household and zero otherwise.
Partner	Dummy variable that signals whether there is a married partner in the household or in the presence of a cohabite he or she is living with and zero otherwise.
Children	Dummy variable that takes the value of one if children are living in the household and zero otherwise.
Human capital	
Training	Dummy variable that takes the value of one if the individual has finished formal training (apprenticeship or university) and zero otherwise.
Labor market history	
Unemployment before	Dummy variable that takes the value of one if the individual has been unemployed in 2002 or 2003 and zero otherwise.
Employment history	Metric variable that is defined as the share of months in employment over the last five years before 2004 and the total time of observation in this period.
Wage before	Metric variables that is defined as the average net monthly wage income in the last five years before 2004.
Contextual characteristics	
Mean unemployment (ue) in occupation	Metric variable that is defined as the average of monthly unemployment periods by occupation. For this measurement, we used the total population in the GSOEP between an ages of 20 and 60 and focus on the two digit classification of occupations).
Kurtosis of ue in occupation	Metric variable; see Mean ue in occupation – instead of the mean we used the kurtosis.
Mean ue in industry	Metric variable; see Mean ue in occupation – instead of the occupation we focus on the two digit industry classification (NACE)
Kurtosis of ue in industry	Metric variable; see Mean ue in industry – instead of the mean we used the kurtosis.
Mean ue in group of firm size	Metric variable; see Mean ue in occupation – instead of the occupations we focused on classification of the firm size measured by the number of employees (1-<5; 5-<20; 20-u200; 200-<2000; >=2000).
Kurtosis of ue in group of firm size	Metric variable; see Mean ue in firm – instead of the mean we used the kurtosis.
Personality	
Accept lower wages	Dummy variable that takes the value of one if the individual is willing to accept a lower wage to find a job. We identify this by using the (self-reported) information about the monthly salary at which the individual would take a job using waves 2005 and 2006 in reference to the average income he or she received in 2003 and 2004. The variable is one only if the difference between the reported reservation wage and the average income is positive and if the difference is greater than on standard deviation of the population difference and is zero otherwise.
Worries about the future	Dummy variable that takes a value of one if the individual states that he worries about economic development or if the states that he worries about his or her personal finances and zero otherwise.
Risk score	Variable between zero and ten based on the question of how much an individual is willing to take risks in their occupation. A value of zero indicates that the individual is not willing to take risks. A value of 10 signals the highest level of willingness to accept risks.

Table A2: Descriptive statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
risk score	472	4,06	2,60	0	10
male	472	0,53	0,50	0	1
age	472	41,88	11,81	22	62
household	472	0,69	0,46	0	1
partner	472	0,09	0,29	0	1
children	472	0,40	0,49	0	1
training	472	0,85	0,36	0	1
unemployed before	472	0,15	0,36	0	1
employment history	472	0,07	0,15	0	0,86
children	472	0,85	0,21	0,05	1
wage before	472	2106	1332	160	9880
mean ue in occupation	472	4,56	0,69	2,25	6,50
kurtosis of ue in occup.	472	2,70	0,68	1,48	5,13
mean ue in industry	472	4,59	0,69	2,37	6,24
kurtosis of ue in ind.	472	2,70	0,57	1,00	4,23
mean ue in the group of firm size	472	4,50	0,44	4,26	6,15
kurtosis of ue in the group of firm size	472	2,81	0,31	1,82	3,10
accept lower wages	472	0,53	0,50	0	1
worries about the future	472	0,69	0,46	0	1

Notes:
GSOEP, own calculations; "ue" stands for the term unemployment

Table A3: Table of correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
risk score (1)	1,000											
male (2)	0,088	1,000										
age (3)	-0,200	-0,026	1,000									
household (4)	-0,046	0,117	0,237	1,000								
partner (5)	0,163	-0,089	-0,189	-0,474	1,000							
children (6)	-0,054	0,101	-0,124	0,101	-0,012	1,000						
training (7)	0,142	0,033	-0,019	0,056	-0,046	0,002	1,000					
unemployed before (8)	0,043	0,003	-0,098	-0,091	-0,031	0,069	-0,022	1,000				
employment history (9)	-0,094	0,089	0,338	0,257	-0,085	-0,086	0,089	-0,468	1,000			
wage before (10)	0,115	0,282	0,327	0,256	-0,148	-0,133	0,077	-0,113	0,358	1,000		
accept lower wages (11)	-0,184	-0,033	0,798	0,217	-0,137	-0,074	0,039	-0,182	0,369	0,278	1,000	
worries about the future (12)	-0,056	0,076	0,062	-0,021	-0,052	0,060	0,058	0,088	-0,030	0,015	0,112	1,000

	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
risk score (13)	1,000								
male (14)	0,088	1,000							
age (15)	-0,200	-0,026	1,000						
mean ue in occupation (16)	-0,133	-0,208	0,064	1,000					
kurtosis of ue in occup. (17)	0,110	0,107	-0,043	-0,523	1,000				
mean ue in industry (18)	-0,011	-0,121	0,048	0,359	-0,243	1,000			
kurtosis of ue in ind. (19)	0,002	0,100	-0,030	-0,209	0,273	-0,730	1,000		
mean ue in the group of firm size (20)	-0,022	0,039	-0,037	0,404	-0,216	0,394	-0,276	1,000	
kurtosis of ue in the group of firm size (21)	0,015	-0,033	0,023	-0,358	0,195	-0,304	0,216	-0,958	1,000

Notes:
GSOEP, own calculations; “ue” stands for the term unemployment

Table A4: Alternative model specifications and estimation results

Variables	M0 (gamma) AFT	M1 (logn;gamma) AFT	M2 (cox) Hazard	M3 (clog; t cat.) Discrete	M4 (clog; t) Discrete	M5 (clog;logt) Discrete	M6 (clog; polyt) Discrete	M7 (clog;baseline) Discrete
career risk score	-0,023	-0,022	0,025	0,029	0,028	0,028	0,028	0,028
male	0,072	0,035	-0,192	-0,213	-0,207	-0,210*	-0,207	-0,208
age	0,064***	0,064***	-0,068***	-0,076***	-0,072***	-0,072***	-0,072***	-0,072***
household	-0,389***	-0,397***	0,399**	0,445***	0,414***	0,414***	0,418***	0,414***
partner	-0,389*	-0,390*	0,390*	0,449*	0,424*	0,424*	0,424*	0,423*
children	-0,197*	-0,163	0,301**	0,331***	0,323***	0,325***	0,325***	0,324***
training	-0,345**	-0,327**	0,394**	0,430**	0,409**	0,413**	0,408**	0,411**
unemployed before	0,157	0,162	-0,155	-0,169	-0,164	-0,164	-0,168	-0,164
employment history	-0,349	-0,297	0,423	0,479	0,437	0,447	0,428	0,442
wage before	-0,000**	-0,000*	0,000**	0,000**	0,000**	0,000**	0,000**	0,000**
mean ue in occupation	0,162*	0,161*	-0,16	-0,182*	-0,175*	-0,176*	-0,174*	-0,175*
mean ue in industry	0,003	-0,006	-0,028	-0,029	-0,022	-0,023	-0,022	-0,022
mean ue in the group of firm size	-0,152	-0,13	0,233	0,259	0,244	0,246	0,241	0,245
accept lower wages	-0,553***	-0,545***	0,613***	0,706***	0,663***	0,668***	0,663***	0,665***
worries about the future	-0,119	-0,129	0,073	0,084	0,083	0,082	0,085	0,083
constant	1,104	0,904		-1,461	-1,560*	-1,566*	-1,546*	-1,620*
ln sigma	0,014	0,065						
ln kappa	0,274							
ln theta		-15,635						
t (dummies)				yes				
t (linear)					-0,002			
t (log)						-0,002		
t (squared)							-0,001	
t (cubic)							0	
t (4th order polynomial)							0	
t (baseline specification)								0,612
N	4227	4227	4227	4174*	4227	4227	4227	4227
quits	306	306	306	306	306	306	306	306
ll	-558,808	-559,784	-1617,06	-1005,89	-1026,75	-1026,771	-1026,671	-1026,76
chi2	111,957	114,582	114,67	176,403	142,707	142,658	142,856	142,678
aic	1153,62	1155,57	3264,12	2099,78	2087,49	2087,541	2091,342	2087,521
bic	1267,9	1269,86	3359,36	2378,59	2195,43	2195,479	2211,978	2195,458

Notes:
GSOEP, own calculations
estimation results base on a gamma distributed duration model (AFT-metric)
* uses fewer observations due to perfect predictions of the upper tail in duration

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